244 Vegetables and Fruit. - Although kitchen-gardening has been encouraged by the Thai government, vegetables and fruit were grown in Bang Chan to a limited extent only. Every family had some sort of kitchen garden, but many edible plants which can be grown in the village were grown by relatively few families. The list of fruits grown in Bang Chan in 1948-49 (Sharp et al., 1953) included four times as many items as were grown by one or more of the 11 families that participated in the dietary study. The list of vegetables and spice plants grown or gathered by these families included 27 items, as compared to 41 listed by Sharp et al. Spices and chili were more commonly grown than vegetables and fruit.[1]

244 One affluent household whose food expenditures for 1949 245 were reported by Sharp et al., (1953, pp. 214-215) produced 433 for home use, 125 kg. of palm sugar valued at 200 baht and 500 coconuts, valued at 450 baht. Home production of both of these was unusual. Few families in Bang Chan grew either sugar palms or coconut palms and expenditures for coconuts and palm sugar were usual. During the major flood of 1942, villagers noted that coconut palms survived whereas all other fruit trees were destroyed. After this, a number of farmers planted coconut palms, but they had not yet begun to produce.

361 In 1954, about 120 acres (300 rai) of the total of about 311 2800 acres (7000 rai) of land in the village were used for [351] home sites and home gardens for 336 households. Individual home sites usually varied in area from about one-quarter to one acre, and were occupied by buildings, threshing floor and space for poultry as well as trees and garden space. Portions of this might be under water for several months of the year. Increased home production of fruit and vegetables would in many cases necessitate increasing the size of the home site by purchase, mounding or both. Ordinarily, increased land for the kitchen garden was obtained at the expense of some of the

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[245] 1. In a typical farm garden in Bang Chan one would find bananas growing, and a number of plants used for seasoning [249] curry. Various kinds of chilies, lemongrass, bergamot, of which both rind and leaves are used, and galangal were grown by all families who participated in the dietary study. Both sweet and holy basil were commonly grown. Many families grew one or more varieties of gourds and of eggplant, some of which [262] can be trained to grow on a tree or trellis. The inflorescence of the banana was also used as a vegetable. Leafy vegetables were not commonly cultivated but some families grew (2)phag (2)ka-(2)cheed, a green water plant, in gardens staked out at the edge of the canal, or in a pool, and some had trees, [262] the leaves of which were edible. Swamp cabbage or (2)phag [262] (3)bung grew wild along the edge of the canals and was the most commonly used green leafy vegetable. A few families [245] grew guava, jujube, star gooseberry, Manila tamarind, mango and pineapple.

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361 rice land. Water-ways, however, were public areas, and any
[505] convenient wide spot might be selected as a private garden. It was marked with stakes, and was apparently not disturbed by others.

262 Mushroom culture as a side line activity of rice far-
344 mers developed during the period when this study was in
433 progress. After threshing, in early 1954, two of eleven families that participated in the dietary study started raising mushrooms. Although most of these were sold, both families reported frequent inclusion of mushrooms in the family diet. One informant commented that families that planted mushrooms also ate them almost every day, and said "Adults complain that it is a wearisome food but children still like it." Mushrooms were used fried, with pork, in soup or in curry.

[434] As with tilapia, mushroom culture appears to have been undertaken primarily to increase cash income, and was abandoned when it was no longer profitable financially (see Appendix A, pp. 101-102).

Food Purchased and Cash Expenditures for Food

262 Relatively few foods were purchased, but some of these,
438 such as onion, garlic, limes, tamarind, coconut and palm sugar were so frequently used that without cash to buy them, villagers would have considered their diet monotonous. Many had their own supply of fresh and dried chilies, fishsoy, and shrimp paste, which might, however, be inadequate for their needs. Other foods not commonly produced in Bang Chan were purchased for variety.

262 Estimates of mean annual consumption and cost of pur-
435 chased foods, for 106 households in Bang Chan are shown in
128 Table 1.

262 The list of purchased foods presented by Janlekha (1955)
432 was compiled after preliminary interviews with a number of household heads. It includes the principal food items which were commonly purchased in Bang Chan. In addition to these, the affluent household studied by Sharp et al. (1953) spent appreciable amounts for vegetables (listed as cucumbers, lettuce, cabbage, etc.) and fruit (pineapple, mangoes, melons, etc.) and small amounts for peanuts, soy sauce and vinegar sauce. Eggplant and white radish were bought by more than half the families that participated in the dietary study, and were used on 11 and 8 survey days respectively. Other vegetables and fruits, bought by one or two of the 11 families, and used on not more than 3 of the 44 survey days were: mung beans, snap beans, bean sprouts, Chinese celery, cucumber, leeks, lettuce, mushrooms, sugar cane, sweet potato, taro, turmeric, (2)ma-(1)faj or rambai, Thai nutmeg, orange, pineapple, rambutan, sandorica and watermelon. Salted and pickled white radish and pickled bamboo shoots were the only

[Text continues on page 23--- Analyst]

BANG CHAN

FOREWORD

The Cornell Thailand Project, like other Cornell University studies in community development, is a long term investigation in the field of the processes involved in changing cultural behavior in a non-industrialized society. Field research was begun in 1948 in the central plain of Thailand with base line studies of the rice farming community of Bang Chan and its environs. A collaborating staff of Thai and Americans representing different disciplines has continued to work in Thailand at Bang Chan and elsewhere in a series of phases extending to the present.

The first interim report issued by the Project gives a general account of the economic, political and social organization of Bang Chan in 1948-49 together with some material on health and diet (Sharp et al., 1953). Since the circulation of this first interim report was limited, some of the salient characteristics of Bang Chan should be outlined here.

Bang Chan is located some twenty roadmiles northeast of Bangkok, the rapidly growing major metropolis and capital of Thailand. The village is between two and three miles west of a small district administrative center and market town, Minburi. A century-old canal and to the north of it a post-war hard surface road connect Minburi and Bangkok so that villagers have easy access to these two centers by boat or bus.

In 1954, when data for the present study were still being gathered, the population of Bang Chan was about 1700, divided among about 300 households. Roughly 60 per cent of the households were made up of independent nuclear families consisting of parents and unmarried children. The average size for all families was 5.7 persons. Rice farming was the main occupation of 80 per cent of all families. The population in 1954 worked and lived on about 2800 acres (7000 rai) of land. With the exception of some 120 acres (300 rai) used for the home sites and home gardens scattered along the network of canals in the village, all land was devoted to the cultivation of wet rice. Nutritional density is thus practically the same as population density. Of the rice crop, 60 per cent or more may be sold, the remainder providing seed, feed, and the staple food of the people. During the wet season and into the cooler dry season, from May or June to February, the growing of the single crop of rice is the main activity. The hot dry season from March until the rice planting begins again is a period of fiestas, ceremonies, and visiting.

The Thai countryside is divided into hamlets, each with a headman in charge of the thirty to sixty households of the hamlet. Seven such hamlets constitute the Bang Chan community. (In the Project studies they are identified by the initials BC and KY followed by a number).

132 The normal distribution of rain in the region, how-
*243 ever, is almost ideal for single crop rice production. Heavy rainfall in May and June softens the soil for easy plowing and harrowing. During July and August, when the young plant does not require much water, the rainfall moderates. Again there is heavy rainfall in September and October when the maturing plant needs rising water as it shoots upward. Finally, during the harvesting season of December and January there is a minimum of rainfall. It is in terms of rainfall that the people divide the year into three seasons: (1) the rainy season of late May to November; (2) the cold season, December into early February; and (3) the dry hot season from late February to early May.

Vegetation

*243 Of the 6,404 rai privately owned in Bangchan 6,106
137 rai is devoted to rice and 298 rai to homelots. During the
• [311] rice season the village is seen as a vast rice field inter-
[351] spersed with bamboos and fruit trees on the homelots which
[361] string along the half dozen canals of the village. In the
[312] dry season only stumps of rice stalks are left in the field.
132 Some of these may be removed by burning. With the coming
231 of rains, which usually fall once or twice in March and four or five times in April, a variety of grasses begin to appear and the rice field is gradually transformed into a grass field, providing a pasture for the buffaloes until the next planting season when the size of the grass field available

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

#243 growing village could not very well be studied in a brief period of only one rice year. Rather, the field study should be extended to cover years of good as well as poor crop.

Land Utilization

Official records show that the area of land privately owned in the seven hamlets comprising Bangchan is 6,404 rai. [503] hen an estimated area of 100 rai of public land occupied by the half dozen canals is added to the private land area, the total area of the village may be figured at about 6,500 rai.

#243 351 423 311 621 The area of each of the 298 homelots in Bangchan varied. It is rather difficult to get accurate figures for these homelot areas. We may, however, give an allowance of one rai for each homelot on the basis of crude estimate. This would include space for buildings and all of the home compound including family pools as well as kitchen garden, and in some cases area devoted to fruit trees. Since all of the land area in Bangchan other than homelots is devoted to rice growing, we may estimate the land available for rice production by simply deducting the homelot area from the total area of land privately owned in the village. This was found to be 6,106 rai in 1953 (Table 12).

#243 311 423 621 It should be noted that not all of this area of 6,106 rai was tilled by Bangchan residents, and that some of the villagers also worked on rice fields outside our arbitrary

[TEXT CONTINUED ON PAGE 113]

7: Janlekha X-4,5 (1948-1953)p956 AO7 Central Thai AO7
Bangchan

TABLE 12

LAND AVAILABLE FOR RICE PRODUCTION
Bangchan, Thailand, 1953

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Hamlet	Land Privately Owned	Allowance for Homelot	Land Available for Rice Production
	rai	rai	rai
BC4	930	40	890
BC5	809	28	781
BC6	900	47	853
KY5	891	63	828
KY6	916	31	885
KY7	939	42	897
KY8	1,019	47	972
Total	6,404	298	6,106

*243 village boundary. Table 13 shows that Bangchan residents
• 311 worked on a combined area slightly larger than that avail-
423 able to them in our arbitrary village limits. This situa-
621 tion of a village resident working on a field outside the village boundary should not be perceived as one in which the farmer in one village had to walk a few miles to work in another village, for in all cases the fields involved were in the peripheral areas.

*243 Since the approach adopted in this study was one
423 through the people rather than through land, for ease in
621 statistical manipulation we shall use the area worked by Bangchan residents to represent our natural Bangchan area. Thus, when we say that 64 per cent of the rice area in Bangchan are owned by operators, we refer to the 4,314 rai of the 6,722 rai worked by Bangchan residents, not the 3,908 rai of the 6,106 rai which is the actual rice area of the village.

*243 In Bangchan, as elsewhere in the country except in limited areas in part of Chiengmai and Lampoon provinces in the north, a single crop of rice is grown without any crop rotation practice. The rice season starts in late May or early June depending upon the actual arrival of the rainy season, and lasts until the harvest of late varieties in the first half of February. At the beginning of the season, the field work is concentrated in the seedbed which is about one-twelfth of the total planting area. Most of the field, then, is not occupied by the crop until transplanting time

[TEXT CONTINUED ON PAGE 115]

*243 well into August and September. Thus, it would appear that the rice field is utilized for only six months of the year, leaving much to be desired for an economic use of it during the other half-year.

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• 311 If consideration is given to the nature of buffalo raising, however, it will be realized that these six months are not actually wasted. In the dry season following rice harvest, buffaloes feed freely on rice stumps in the fields and on supplementary straw accumulated in the homelot during threshing. After the first few showers of rain in April, the fields are gradually covered with noncultivated grasses and the buffaloes enjoy this green feed all the more. Even when the fields are wet enough for plowing in June, the early field work is concentrated on the seedbed, leaving the greater part of the fields which have not yet been plowed to the buffaloes to graze usually during their 10 a.m. to 2 p.m. recess from work in the seedbed. When the farmer starts working on the fields other than the seedbed, the grazing area is gradually reduced and the buffaloes are now partially fed with green grasses which grow wild in limited areas between rice fields and canals to which the farmer has customary right. As the grazing area is further reduced, more and more grasses are given. By the time all the fields have been plowed, the buffaloes are totally fed with the green grasses. This total green grass feeding lasts until the next harvesting season when straw becomes available to supplement green grasses which now become

7: Janlekha X-4,5 (1948-1953)p956 AO7 Central Thai AO7
Bangchan

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• 911 more scarce as the dry season creeps in, thus completing the annual buffalo feeding cycle.

*243 Double cropping has been suggested as a means by
231 which farm income may be increased. To this suggestion
911 several obstacles have been mentioned, most important of
[312] which center around the lack of ample water supply and water control and an envisaged severity of pests predatory on an early crop.[2] In the light of the discussion in the previous paragraph, the inevitable reduction of grazing area and the consequent loss of feed supply may be added to the list of obstacles to double cropping. It is rather unfortunate that little attention has been paid to this all important problem of buffalo feeding. The general idea seems to follow the line that there is no problem of feed and that the only problem concerning draft animals lies in the control of diseases. If this negligence persists, there is danger that the uncultivated grasses which are the least expensive buffalo feed might be depleted. Because of limited grazing area, buffaloes in most commercial rice growing villages in the Central plain are already not reproducing themselves rapidly enough to maintain their number. This is evident in the annual importation into the region from the northeast of inferior stock which is less strong and has shorter life. Without grass conservation, it would not be long when Thai farmers will have to deliberately "grow grass" for their

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2. Janlekha, op. cit.

243 buffaloes heretofore undreamt of and will have to bear
231 the consequent burden of increased cost of producing rice.
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Some description of the homelots which constitute
311 almost five per cent of the land area of Bangchan has already
351 been given in the section on vegetation, Chapter II. From
[231] the standpoint of land utilization, functions of the homelot
[235] other than providing standing room for the living quarters
[244] may be mentioned as follows:
[245]
[226]

1. It provides space for threshing and for storage of rice and farm equipment including buffaloes.
2. It provides room for chicken or duck raising.
3. It provides land for a kitchen garden, and for fruit and vegetable growing.
4. It provides space for fish trapping by the draining method.

To serve these functions, homelots in any rice growing village, where the fields are submerged under water during the entire life of the rice plant, must be high above water level during the flood season, must be well drained, and must have pools with ample shade.

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311 Rice land in its natural state does not meet these requirements for a homelot. In the first place its level is too low. Second, the impervious layer of clay characteristic of rice land does not permit soil drainage. To make a homelot out of rice land, it is necessary that the prospective site be mounded up to a level two or three feet higher than the level of the surrounding fields. The hole from which

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

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earth has been removed for the purpose of raising the yard becomes a fish pool simply by the construction of a ditch connecting the hole with the canal, thus partially giving the last mentioned requisite of a homelot. Again, in the process of mounding up the homelot the soil may be made well drained by skillful handling of the earth. The technique adopted by the Chinese experts in the famous truck gardening area of Damnernsaduag is to remove the top soil first from the strip intended to be the ridge of the prospective vegetable garden. Then the top soil of the adjacent area intended to be the pool is also removed, and these top soils from the two adjacent strips of land are put together in one pile. Next, the tough subsoil of the pool strip is dug up and placed over the bare subsoil of the ridge strip. Finally, the subsoil ridge thus elevated is covered with the topsoils from the mixed pile. By this manipulation the depth of the top soil of the newly created ridge is greatly increased from the original depth of about 8-10 inches to perhaps 16-20 inches. The presence of the pool, also newly created, along the ridges further enhances the draining quality of the strip. Unfortunately, this technique was unknown in Bangchan, and mounding of the homelot was done by simply dumping the earth dug out from the strip intended to be the pool all over the land area of the prospective homelot. With the presence of the pool which served as a receptacle for water and with constant hoeing of the garden area, the soil depth also was increased and the draining quality improved.

7: Janiekha X-4,5 (1948-1953)p956 AO7 Central Thai AO7
Bangchan

TABLE 14

VILLAGE RICE ACREAGE, CROP, AVERAGE YIELD, AND CROP INDEX BY YEAR, 1948-52

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Year	Area Planted to Rice	Total Crop	Av. Yield Per Rai	Crop Index*
	rai	tang	tang	
1948	3,384	108,760	32.1	111.4
1949	3,130	77,692	25.0	86.8
1950	3,102	99,225	32.0	111.1
1951	3,039	89,898	29.6	102.7
1952	3,046	76,670	25.2	87.5
Total	15,701	452,445	--	--
Average	3,140	90,489	28.8	100.0

* Average yield during 1948-1952 as 100.

7: Janlekha X-4,5 (1948-1953)p956 AO7 Central Thai AO7
Bangchan

243 433 128 of village production and surplus of paddy (Table 16) there were no comparable basis for our estimate of the other crops. Our estimates of these other crops should therefore be considered as crude estimates.

433 418 435 Tables 16 and 17 show that in 1953 Bangchan had surpluses of 104,756 tang of paddy, 293,232 chicken eggs, and 67,050 duck eggs, and a deficit of 4,945 kilograms of fish. Using the 1953 farm prices of 9 baht per tang of paddy, 0.40 baht per chicken egg, 0.50 baht per duck egg, and 5 baht per kilogram of fish, village exports may be estimated at 942,804 baht for paddy, 146,616 baht for chicken eggs, and 33,525 baht for duck eggs, and village import of fish may be estimated at 24,725 baht.

243 311 423 427 Land Tenure

Table 18 shows that Bangchan residents owned an aggregate area of 4,315 rai. Since their combined area planted to rice was 6,722 rai, the balance of 2,407 rai had to be provided by absentee landowners. In fact an area larger than 2,407 rai had to be rented in because part of the area owned by local residents had to be used as homelots. Actually, the net area rented in was 2,438 rai (total area rented in of 3,641 rai minus total area of 1,203 rai rented out). It is not to be expected, however, that this extra area of 31 rai (an excess of 2,438 over 2,407 rai) is enough to accommodate the 298 homelots in the village. Inaccuracies might have arisen in cases of joint ownership of certain

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7: Janlekha X-4.5 (1948-1953)p956 AO7 Central Thai AO7
Bangchan

TABLE 18

RICE AREAS WORKED, OWNED, RENTED IN, AND RENTED OUT
Bangchan, Thailand, 1953

Hamlet	Total Families	Total Population	Area In Rai			
			Worked	Owned	Rented In	Rented Out
BC4	40	236	801	849	413	458
BC5	28	136	497	305	261	69
BC6	47	270	1,102	576	531	--
KY5	63	356	1,295	963	834	487
KY6	31	168	850	585	354	96
KY7	42	250	1,016	597	527	108
KY8	47	278	1,161	440	721	--
Total	298	1,694	6,722	4,315	3,641	1,203
Areas per family			22.4	14.5	12.2	4.0
Areas per man			4.0	2.5	2.1	0.7

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

369 It should be noted also that once a villager has moved
167 into Bangkok he will be deprived of the privilege to
162 acquire free food from nature -- an important economic advantage of living in the village which counts heavily when emigration to the city is being seriously contemplated.

427 It is seen, then, that the demand for land on the
423 part of land-thirsty operators -- the tenants, part-owners, and owner-operators -- was high and inelastic, while the demand for land on the part of land-saturated landlord-operators was low and elastic. Since the combined demand of all landlord-operators constituted only a small fraction of the total demand (Table 20), it may be safely concluded that the aggregate demand for land in Bangchan at the period we are dealing with was high and inelastic.

311 Let us now consider the supply side of land. For
423 the purpose of this discussion we may differentiate four
427 sources of supply of a total of 6,722 rai considered to
463 represent our natural Bangchan area. They are:

1. Land-thirsty operators -- all for implicit rent.
   a, Owner-operators 2,131 rai
   b, Part-owners 227 rai
   c, Tenants 225 rai
   Sub-total 2,583 rai

2. Land-saturated operators (landlord-operators).
   a, For implicit rent 537 rai
   b, For explicit rent 683 rai
   Sub-total 1,220 rai

3. Local non-operators -- all for explicit rent.
   a, Traders 189 rai
   b, Investors 149 rai
   c, Public servants 165 rai
   Sub-total 503 rai

7: Janlekha X-4,5 (1948-1953)p956 AO7 Central Thai-AO7
Bangchan

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4. Non-indigenous landlords 2,416 rai (all for explicit rent).

To understand the working of the supply forces, it is necessary to break the non-indigenous landlords down into those living in the neighborhood of Bangchan, which we shall henceforth call the neighboring landlords, and those living far away, which we shall call the absentee landlords. It is regrettable that accurate figures for these breakdowns were not available, but it may be estimated on the basis of some known cases that they were roughly of the same proportion, that is, some 1,208 rai in this category were owned by neighboring landlords and the same amount by absentee landlords. On the basis of the same known cases, it may be generalized that the area of land owned by an average absentee landlord was larger than that owned by an average neighboring landlord.

It is obvious that the individual supply of land varies according to the type of the people who have command over it. Generally speaking, land-thirsty operators who supply part of their own working areas should provide an inelastic supply of land, for they will continue to offer to themselves all the land they own regardless of how the rent rate may change. All lands owned by land-thirsty operators yield only implicit rents, for if they are rented out for explicit rents, the landowners of the parcles in question would have changed their status to landlord-operators.

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

*243 178 463 • [311] become investors, traders, and public servant. In 1948, these eight families were operating farms of a combined area of 286 rai, ranging from 20 rai to 80 rai, averaging 36 rai per farm. Seven of these eight families owned rice fields totalling 201 rai, ranging from 5 rai to 80 rai, averaging 29 rai per family owning land. Evidently, it may be said that these seven families deliberately had given up farming in favor of new occupations from which they expected higher remunerations. As for the one family owning no land, the same generalization still holds. This family was operating a 22-rai farm in 1948, a farm of optimum size which could be expected to yield a higher income than any of those operated by the thirteen former operators who had turned farm laborers. The head of this family, nevertheless, got a permanent job in the Bangkok Harbor, a government owned concern, with a salary of more than 7,000 baht annually which is much higher than his former net income from operating a rented farm. [464] [465]

A case has thus been built for the relative unattractiveness of farm operating occupation among a certain sector of farm operators who had shifted to other occupations. This was responsible for the decline of farm operating occupation from 80 per cent of the occupational structure of the village in 1949 to 72 per cent in 1953 (Table 11). If it had not been for the 14 new families branching out from existing families who had taken up farming during the period between 1949 and 1953, the decline would have been more abrupt.